

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A method for controlling call admission to a communication system

comprising:

5 assigning a respective overbooking factor to each of a plurality of service classes;

determining an effective bandwidth for each class based in part on said respective assigned overbooking factor;

10 determining a value of a free bandwidth in said communication system based in part on said determined effective bandwidth for each service class; and

admitting or rejecting said call based on said determined value for said free bandwidth.

2. The method according to claim 1, wherein said step of determining a free bandwidth further comprises:

15 determining a maximum bandwidth at a port in the communication system; and

subtracting at least a portion of the effective bandwidth for each class from said maximum bandwidth.

3. The method according to claim 2, wherein said step of subtracting further comprises:

dividing the effective bandwidth for each class by its respective assigned overbooking factor to produce a result; and

5 subtracting said result from said maximum bandwidth.

4. The method according to claim 1, wherein said step of admitting or rejecting further comprises:

admitting said call if said free bandwidth is greater than zero.

5. The method according to claim 4, wherein said step of admitting or rejecting further comprises:

rejecting said call if said free bandwidth is less than zero.

6. The method according to claim 1, wherein said plurality of service classes includes a constant bit rate class.

7. The method according to claim 1, wherein said plurality of service classes includes a variable bit rate class.

8. The method according to claim 7, wherein said variable bit rate class includes a real time variable bit rate class.

9. The method according to claim 7, wherein said variable bit rate class includes a non-real time variable bit rate class.

10. The method according to claim 1, wherein said assigned overbooking factor has a default value indicating no overbooking.

5 11. The method according to claim 10, wherein said default value is 1.

12. The method according to claim 1, wherein said communication system is an ATM network.

13. The method according to claim 1, wherein said communication system is an IP network.

10 14. A method for performing bookkeeping in a communication system when a new connection setup is requested comprising:

calculating an effective bandwidth of the new connection to meet a first predetermined criteria;

calculating a variance for a traffic load of the new connection;

15 calculating a required bandwidth for all calls in the system to meet the first predetermined criteria based in part on said effective bandwidth and said variance of the new connection;

calculating an effective bandwidth of the new connection to meet a second predetermined criteria;

calculating a required bandwidth for all calls in the system to meet the second predetermined criteria;

5       calculating a required system bandwidth based on a maximum value for said required bandwidth for all calls in the system to meet the first predetermined criteria and said required bandwidth for all calls in the system to meet the second predetermined criteria;

10      comparing said required system bandwidth to a maximum bandwidth of said system; and

admitting or rejecting said call based on said comparison.

15.     The method according to claim 14, further comprising:

updating state variables of the system if said call is admitted.

16.     The method according to claim 14, wherein said step of admitting or

15      rejecting further comprises:

admitting said call if said required system bandwidth is less than said maximum bandwidth.

17. The method according to claim 16, wherein said step of admitting or rejecting further comprises:

rejecting said call if said required system bandwidth is greater than said maximum bandwidth.

5 18. The method according to claim 14, wherein said first predetermined criteria is a cell loss ratio.

19. The method according to claim 18, wherein said second predetermined criteria is a cell delay variation.

20. The method according to claim 14, wherein said step of calculating an  
10 effective bandwidth of the new connection to meet a second predetermined criteria further comprises:

calculating an effective bandwidth of all calls in the system to meet the second predetermined criteria.

21. The method according to claim 20, further comprising:

15 updating state variables of the system if said call is admitted.

22. The method according to claim 20, wherein said step of admitting or rejecting further comprises:

admitting said call if said required system bandwidth is less than said maximum bandwidth.

23. The method according to claim 22, wherein said step of admitting or rejecting further comprises:

5           rejecting said call if said required system bandwidth is greater than said maximum bandwidth.

24. The method according to claim 20, wherein said first predetermined criteria is a cell loss ratio.

10          25. The method according to claim 24, wherein said second predetermined criteria is a cell delay variation.

26. The method according to claim 14, wherein said communication system is a wireless communication system.

27. A method for performing bookkeeping in a communication system when an existing call requests to be released from the system comprising:

15          calculating an effective bandwidth of the call requested to be released that satisfies a first predetermined criteria;

calculating a variance for a traffic load of the call requested to be released;

calculating a required bandwidth for all remaining calls in the system that satisfies the first predetermined criteria;

calculating an effective bandwidth of the call requesting to be released and all remaining calls in the system that satisfies a second predetermined criteria;

5 calculating a required bandwidth for all remaining calls in the system that satisfies the second predetermined criteria;

allocating a required system bandwidth based on a maximum value for said required bandwidth for all remaining calls in the system that satisfies the first predetermined criteria and said required bandwidth for all remaining calls in the 10 system that satisfies the second predetermined criteria; and

releasing the call requesting to be released.

28. The method according to claim 27, wherein said step of calculating a variance further comprises:

15 updating state variables of the system based on said call requesting to be released.

29. The method according to claim 27, wherein said first predetermined criteria is a cell loss ratio.

30. The method according to claim 29, wherein said second predetermined criteria is a cell delay variation.

31. The method according to claim 27, wherein said communication system is an ATM network.

5 32. The method according to claim 27, wherein said communication system is an IP network.

33. A method for performing bookkeeping in a communication system when an existing call requests to be released from the system comprising:

determining an effective bandwidth that satisfies a first predetermined criteria  
10 for the call requesting to be released;

calculating a variance for a traffic load of the call requesting to be released for  
said first predetermined criteria;

calculating an effective bandwidth of the call requesting to be released that  
satisfies a second predetermined criteria;

15 calculating a variance for a traffic load of the call requesting to be released for  
said second predetermined criteria;

calculating a required bandwidth of all remaining calls in the system that  
satisfies the first predetermined criteria;

- calculating an effective bandwidth of all remaining calls in the system that satisfies the second predetermined criteria;
- allocating a required system bandwidth based on a maximum value for said required bandwidth for all remaining calls in the system that satisfies the first
- 5 predetermined criteria and said required bandwidth for all remaining calls in the system that satisfies the second predetermined criteria; and
- releasing the call requesting to be released.
34. The method according to claim 33, wherein said step of calculating a variance for a traffic load of the call requested to be released for said second predetermined
- 10 criteria further comprises:
- updating state variables of the system based on said call requesting to be released.
35. The method according to claim 33, wherein said first predetermined criteria is a cell loss ratio.
- 15 36. The method according to claim 35, wherein said second predetermined criteria is a cell delay variation.
37. The method according to claim 33, wherein said communication system is an ATM network.

38. The method according to claim 33, wherein said communication system is an IP network.

39. An access terminal for a communications system, comprising:

a multiplexer/demultiplexer unit; and

5 a programmed processor coupled to said multiplexer/demultiplexer unit, said programmed processor performing a method for controlling call admission to said communications system, said method comprising:

assigning a respective overbooking factor to each of a plurality of service classes;

10 determining an effective bandwidth for each class based in part on said respective assigned overbooking factor;

determining a value of a free bandwidth in said communication system based in part on said determined effective bandwidth for each service class; and

15 admitting or rejecting said call based on said determined value for said free bandwidth.

40. The access terminal according to claim 39, wherein said step of determining a free bandwidth further comprises:

determining a maximum bandwidth at a port in the communication system;  
and

subtracting at least a portion of the effective bandwidth for each class from  
said maximum bandwidth.

5 41. The access terminal according to claim 40, wherein said step of subtracting  
further comprises:

dividing the effective bandwidth for each class by its respective assigned  
overbooking factor to produce a result; and

subtracting said result from said maximum bandwidth.

10 42. The access terminal according to claim 39, wherein said step of admitting or  
rejecting further comprises:

admitting said call if said free bandwidth is greater than zero.

43. The access terminal according to claim 42, wherein said step of admitting or  
rejecting further comprises:

15 rejecting said call if said free bandwidth is less than zero.

44. The access terminal according to claim 39, wherein said plurality of service  
classes includes a constant bit rate class.

45. The access terminal according to claim 39, wherein said plurality of service classes includes a variable bit rate class.

46. The access terminal according to claim 45, wherein said variable bit rate class includes a real time variable bit rate class.

5 47. The access terminal according to claim 45, wherein said variable bit rate class includes a non-real time variable bit rate class.

48. The access terminal according to claim 39, wherein said assigned overbooking factor has a default value indicating no overbooking.

49. The access terminal according to claim 48, wherein said default value is 1.

10 50. The access terminal according to claim 39, wherein said communication system is an ATM network.

51. The access terminal according to claim 39, wherein said communication system is an IP network.

52. The access terminal according to claim 39, wherein said access terminal is  
15 daisy chained to at least one other access terminal, each of said access terminals performing said method for controlling call admission independently of the other.

53. An access terminal for a communication system, comprising:

a programmed processor for performing a method for bookkeeping in said communication system when a new connection setup is requested, said method comprising:

- calculating an effective bandwidth of the new connection to meet a first predetermined criteria;
- calculating a variance for a traffic load of the new connection;
- calculating a required bandwidth for all calls in the system to meet the first predetermined criteria based in part on said effective bandwidth and said variance of the new connection;
- calculating an effective bandwidth of the new connection to meet a second predetermined criteria;
- calculating a required bandwidth for all calls in the system to meet the second predetermined criteria;
- calculating a required system bandwidth based on a maximum value for said required bandwidth for all calls in the system to meet the first predetermined criteria and said required bandwidth for all calls in the system to meet the second predetermined criteria;

comparing said required system bandwidth to a maximum bandwidth of said system; and

admitting or rejecting said call based on said comparison.

54. The access terminal according to claim 53, wherein said method further  
5 comprises:

updating state variables of the system if said call is admitted.

55. The access terminal according to claim 53, wherein said step of admitting or  
rejecting further comprises:

- 10 admitting said call if said required system bandwidth is less than said  
maximum bandwidth.

56. The access terminal according to claim 55, wherein said step of admitting or  
rejecting further comprises:

rejecting said call if said required system bandwidth is greater than said  
maximum bandwidth.

- 15 57. The access terminal according to claim 53, wherein said first predetermined  
criteria is a cell loss ratio.

58. The access terminal according to claim 57, wherein said second predetermined criteria is a cell delay variation.
59. The access terminal according to claim 53, wherein said step of calculating an effective bandwidth of the new connection to meet a second predetermined criteria further comprises:
- calculating an effective bandwidth of all calls in the system to meet the second predetermined criteria.
60. The access terminal according to claim 59, wherein said method further comprises:
- 10            updating state variables of the system if said call is admitted.
61. The access terminal according to claim 59, wherein said step of admitting or rejecting further comprises:
- admitting said call if said required system bandwidth is less than said maximum bandwidth.
- 15    62. The access terminal according to claim 61, wherein said step of admitting or rejecting further comprises:
- rejecting said call if said required system bandwidth is greater than said maximum bandwidth.

63. The access terminal according to claim 59, wherein said first predetermined criteria is a cell loss ratio.

64. The access terminal according to claim 63, wherein said second predetermined criteria is a cell delay variation.

5 65. The access terminal according to claim 53, wherein said communication system is an ATM network.

66. The access terminal according to claim 53, wherein said communication system is an IP network.

10 67. The access terminal according to claim 53, wherein said access terminal is daisy chained to at least one other access terminal, each of said access terminals performing said method for controlling call admission independently of the other.

68. A telecommunications apparatus, comprising:

a programmed processor for performing a method for bookkeeping in a communication system when an existing call requests to be released from the system,  
15 said method comprising:

calculating an effective bandwidth of the call requested to be released that satisfies a first predetermined criteria;

calculating a variance for a traffic load of the call requested to be released;

calculating a required bandwidth for all remaining calls in the system that satisfies the first predetermined criteria;

calculating an effective bandwidth of the call requesting to be released and all remaining calls in the system that satisfies a second predetermined criteria;

5 calculating a required bandwidth for all remaining calls in the system that satisfies the second predetermined criteria;

allocating a required system bandwidth based on a maximum value for said required bandwidth for all remaining calls in the system that satisfies the first predetermined criteria and said required bandwidth for all remaining calls in the 10 system that satisfies the second predetermined criteria; and

releasing the call requesting to be released.

69. The apparatus to claim 68, wherein said step of calculating a variance further comprises:

15 updating state variables of the system based on said call requesting to be released.

70. The apparatus according to claim 68, wherein said first predetermined criteria is a cell loss ratio.

71. The apparatus according to claim 70, wherein said second predetermined criteria is a cell delay variation.

72. The apparatus according to claim 68, wherein said communication system is an ATM network.

5 73. The apparatus according to claim 68, wherein said communication system is an IP network.

74. A telecommunications apparatus, comprising:

a programmed processor for performing a method for bookkeeping in a communication system when an existing call requests to be released from the system,

10 said method comprising:

determining an effective bandwidth that satisfies a first predetermined criteria for the call requesting to be released;

calculating a variance for a traffic load of the call requesting to be released for said first predetermined criteria;

15 calculating an effective bandwidth of the call requesting to be released that satisfies a second predetermined criteria;

calculating a variance for a traffic load of the call requesting to be released for said second predetermined criteria;

calculating a required bandwidth of all remaining calls in the system that satisfies the first predetermined criteria;

calculating an effective bandwidth of all remaining calls in the system that satisfies the second predetermined criteria;

5       allocating a required system bandwidth based on a maximum value for said required bandwidth for all remaining calls in the system that satisfies the first predetermined criteria and said required bandwidth for all remaining calls in the system that satisfies the second predetermined criteria; and

releasing the call requesting to be released.

10     75.     The apparatus according to claim 74, wherein said step of calculating a variance for a traffic load of the call requested to be released for said second predetermined criteria further comprises:

updating state variables of the system based on said call requesting to be released.

15     76.     The apparatus according to claim 74, wherein said first predetermined criteria is a cell delay variation.

77.     The apparatus according to claim 76, wherein said second predetermined criteria is a cell loss ratio.

78. The apparatus according to claim 74, wherein said communication system is a wireless communication system.

79. The apparatus according to claim 74, wherein said apparatus is daisy chained to at least one other apparatus, each of said apparatuses performing said method for  
5 controlling call admission independently of the other.

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